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# Lake Mendocino
# Mendocino County, California

National Eutrophication Survey, Corvallis, Oreg

Prepared for

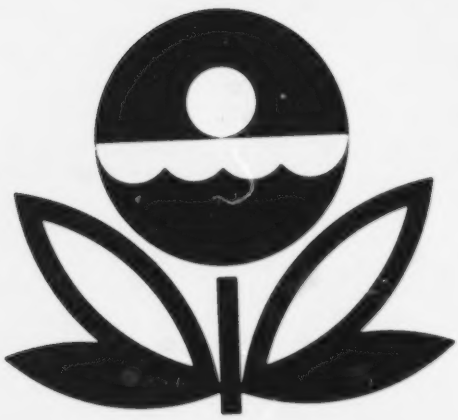
Corvallis Environmental Research Lab, Oreg

1973

PB 282 598

# U.S. ENVIRONMENTAL PROTECTION AGENCY
# NATIONAL EUTROPHICATION SURVEY

## WORKING PAPER SERIES



REPORT
ON
LAKE MENDOCINO
MENDOCINO COUNTY
CALIFORNIA
EPA REGION IX
WORKING PAPER No. 752

**CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON**
**and**
**ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA**

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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# FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

## OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

## ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

## LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentration (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the California State Water Resources Control Board and the nine Regional Water Quality Control Boards for professional involvement, to the California National Guard for conducting the tributary sampling phase of the Survey, and to those California wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staff of the Division of Planning and Research of the State Water Resources Control Board provided invaluable lake documentation and counsel during the Survey, coordinated the reviews of the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

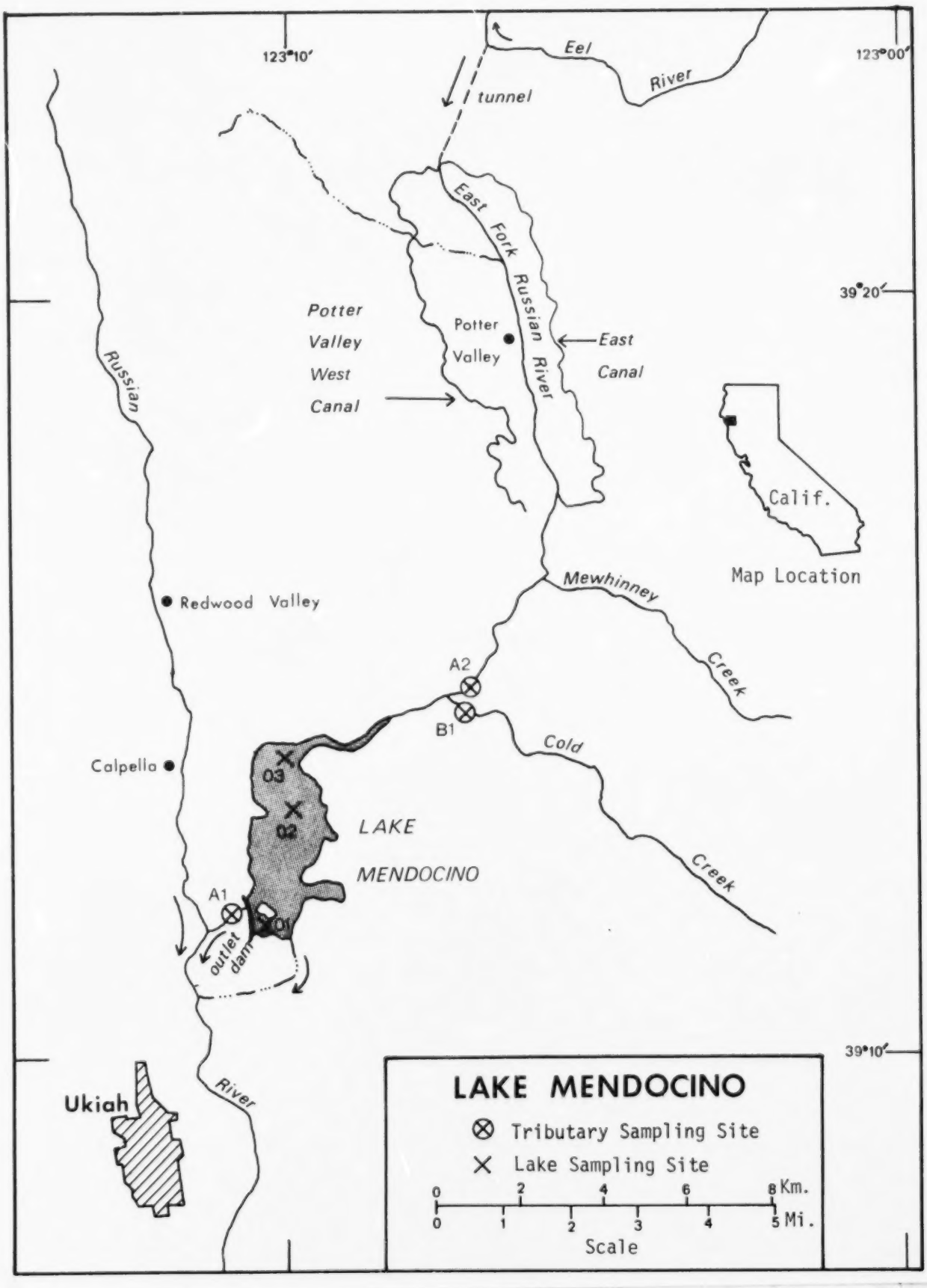
Major General Glen C. Ames, the Adjutant General of California, and Project Officer Second Lieutenant Terry L. Barrie, who directed the volunteer efforts of the California National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

State of California

| Name | County |
|---|---|
| Amador | Amador |
| Boca | Nevada |
| Britton | Shasta |
| Casitas | Ventura |
| Crowley | Mono |
| Don Pedro | Tuolumne |
| Elsinore | Riverside |
| Fallen Leaf | El Dorado |
| Hennessey | Napa |
| Henshaw | San Diego |
| Iron Gate | Siskiyou |
| Lopez | San Luis Obispo |
| Mary | Mono |
| Mendocino | Mendocino |
| Nicasio | Marin |
| Lower Otay | San Diego |
| Pillsbury | Lake |
| Santa Margarita | San Luis Obispo |
| Shasta | Shasta |
| Shaver | Fresno |
| Silver | Mono |
| Tahoe | El Dorado, Placer, CA; Carson City, Douglas, Washoe, NV |
| Tulloch | Calaveras, Tuolumne |
| Lower Twin | Mono |
| Upper Twin | Mono |


123°10′
123°00′
39°20′
39°10′
Eel River
tunnel
East Fork Russian River
Potter Valley
Potter Valley West Canal
East Canal
Russian River
Calif.
Map Location
Redwood Valley
Mewhinney Creek
A2
B1
Cold Creek
Calpella
03
02
01
LAKE MENDOCINO
A1
outlet dam
Ukiah
River
LAKE MENDOCINO
Tributary Sampling Site
Lake Sampling Site
0 2 4 6 8 Km.
0 1 2 3 4 5 Mi.
Scale

LAKE MENDOCINO

STORET NO. 0616

# I. CONCLUSIONS

## A. Trophic Condition*:

Survey data indicate Lake Mendocino is meso-eutrophic. It ranked ninth in overall trophic quality when the 24 California lakes and reservoirs sampled in 1975 were compared using a combination of six parameters**. Eight of the water bodies had less median total phosphorus, eight had less and one had the same median orthophosphorus, six had less and one had the same median inorganic nitrogen, six had less mean chlorophyll a, and 16 had greater mean Secchi disc transparency. Although no significant decrease in dissolved oxygen with depth was apparent at any of the Survey sampling times, hypolimnetic depression has occurred during summer stratification (Bailey, 1977).

The rather low mean chlorophyll a concentration (3.1 µg/l), the numbers of algae in the phytoplankton samples (page 6), and the relative lack of Secchi disc transparency (mean of 1.3 meters) indicate the primary productivity of the reservoir may be light-limited at times. Survey limnologists noted the entire reservoir was turbid in March and along the east shoreline in June. Turbidity of natural origin is reported to be a problem in this water body (Johns, 1975).

## B. Rate-Limiting Nutrient:

A significant change in nutrients occurred in the algal assay

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* Trophic assessment is based on the levels of nutrients, dissolved oxygen, and chlorophyll a; phytoplankton kinds and numbers, and transparency (Allum et al., 1977).

** See Appendix A.

sample during shipment from the field to the laboratory, and the assay results are not considered representative of conditions in the reservoir at the time the sample was taken (11/11/75).

The reservoir data indicate nitrogen limitation at all sampling times. However, as noted above, primary productivity may be light-limited at times rather than nutrient-limited.

C. Nutrient Controllability:

1. Point sources--No known point sources impact Lake Mendocino. Nonetheless, the phosphorus loading of 3.96 $g/m^2$ measured during the sampling year is over three times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 11). If this loading is a typical annual loading and cannot be reduced, the trophic condition of the reservoir can be expected to deteriorate.

2. Non-point sources--Apparently, non-point sources contributed the entire phosphorus load to the reservoir during the sampling year. The East Fork Russian River added 90.1% of the total load, and the ungaged minor tributaries and immediate drainage contributed an estimated 9.5% of the total.

The phosphorus export rate of the East Fork was a very high 118 $kg/km^2$ during the sampling year. However, land-use practices in the drainage are not believed to contribute significantly to the phosphorus load in the river (Church, 1976). Landslides and erosion occur in the Eel River watershed upstream from the diversion (Johns, op. cit.) and may contribute to the phosphorus load in the East Fork.

## II. RESERVOIR AND DRAINAGE BASIN CHARACTERISTICS†

### A. Morphometry††:

1. Surface area: 7.92 kilometers$^2$.
2. Mean depth: 19.1 meters.
3. Maximum depth: 51.8 meters.
4. Volume: 151.103 x $10^6$ $m^3$.
5. Mean hydraulic retention time: 168 days (based on outflow).

### B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

| Name | Drainage area ($km^2$)* | Mean flow ($m^3$/sec)* |
|---|---|---|
| East Fork Russian River | 238.8 | 10.480 |
| Minor tributaries & immediate drainage - | 25.2 | 0.472 |
| Totals | 264.0 | 10.952 |

2. Outlet -

| | | |
|---|---|---|
| East Fork Russian River | 271.9 | 10.400 |

### C. Precipitation***:

1. Year of sampling: 105.2 centimeters.
2. Mean annual: 97.6 centimeters.

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† Table of metric equivalents--Appendix B.
†† Dendy, 1974.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of reservoir.
*** See Working Paper No. 175.

## III. WATER QUALITY SUMMARY

Lake Mendocino was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at two stations in March and June and three stations in November (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the November visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll *a* analysis. The maximum depths sampled were 27.7 meters at station 1, 11.3 meters at station 2, and 8.8 meters at station 3.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR MENDOCINO LAKE
STORET CODE 0616

| PARAMETER | 1ST SAMPLING ( 3/12/75) 2 SITES RANGE | MEAN | MEDIAN | 2ND SAMPLING ( 6/26/75) 2 SITES RANGE | MEAN | MEDIAN | 3RD SAMPLING (11/11/75) 3 SITES RANGE | MEAN | MEDIAN |
|---|---|---|---|---|---|---|---|---|---|
| TEMP (C) | 7.5 - 10.2 | 9.1 | 9.5 | 8.9 - 20.8 | 16.3 | 18.8 | 11.7 - 14.3 | 13.7 | 13.9 |
| DISS OXY (MG/L) | 9.6 - 10.2 | 10.0 | 10.0 | 5.6 - 10.0 | 7.2 | 6.8 | 8.6 - 10.6 | 9.0 | 8.8 |
| CNDCTVY (MCROMO) | 100. - 108. | 104. | 104. | 122. - 171. | 151. | 156. | 67. - 107. | 82. | 81. |
| PH (STAND UNITS) | 7.4 - 7.9 | 7.7 | 7.8 | 7.5 - 8.3 | 7.9 | 7.6 | 8.0 - 8.7 | 8.2 | 8.1 |
| TOT ALK (MG/L) | 63. - 67. | 65. | 65. | 74. - 78. | 76. | 76. | 64. - 92. | 82. | 82. |
| TOT P (MG/L) | 0.091 - 0.118 | 0.106 | 0.105 | 0.013 - 0.330 | 0.056 | 0.025 | 0.013 - 0.020 | 0.016 | 0.016 |
| ORTHO P (MG/L) | 0.018 - 0.023 | 0.020 | 0.020 | 0.002 - 0.027 | 0.013 | 0.013 | 0.004 - 0.010 | 0.005 | 0.004 |
| NO2+NO3 (MG/L) | 0.150 - 0.200 | 0.165 | 0.160 | 0.020 - 0.230 | 0.077 | 0.040 | 0.020 - 0.040 | 0.021 | 0.020 |
| AMMONIA (MG/L) | 0.030 - 0.040 | 0.031 | 0.030 | 0.020 - 0.050 | 0.031 | 0.030 | 0.020 - 0.020 | 0.020 | 0.020 |
| KJEL N (MG/L) | 0.200 - 0.700 | 0.345 | 0.300 | 0.200 - 0.400 | 0.270 | 0.300 | 0.200 - 0.300 | 0.207 | 0.200 |
| INORG N (MG/L) | 0.180 - 0.230 | 0.195 | 0.190 | 0.040 - 0.280 | 0.108 | 0.065 | 0.040 - 0.060 | 0.041 | 0.040 |
| TOTAL N (MG/L) | 0.350 - 0.870 | 0.510 | 0.480 | 0.220 - 0.530 | 0.347 | 0.340 | 0.220 - 0.320 | 0.229 | 0.220 |
| CHLRPYL A (UG/L) | 1.1 - 1.2 | 1.1 | 1.1 | 2.4 - 3.3 | 2.8 | 2.8 | 2.6 - 5.7 | 4.6 | 5.4 |
| SECCHI (METERS) | 0.3 - 0.3 | 0.3 | 0.3 | 2.4 - 3.5 | 3.0 | 3.0 | ****** -********** | | |

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B. Biological characteristics:

1. Phytoplankton -

| Sampling Date | Dominant Genera | Algal Units per ml |
|---|---|---|
| 03/12/75 | 1. *Melosira sp.* | 313 |
| | 2. *Chroomonas* (?) *sp.* | 57 |
| | Total | 370 |
| 06/26/75 | 1. *Chroomonas* (?) *sp.* | 1,188 |
| | 2. *Ankistrodesmus sp.* | 64 |
| | 3. *Cryptomonas sp.* | 64 |
| | Total | 1,316 |
| 11/11/75 | 1. *Chroomonas* (?) *sp.* | 1,101 |
| | 2. *Oscillatoria sp.* | 227 |
| | 3. *Cryptomonas sp.* | 194 |
| | 4. *Melosira sp.* | 81 |
| | 5. *Stephanodiscus sp.* | 81 |
| | Other genera | 115 |
| | Total | 1,799 |

2. Chlorophyll *a* -

| Sampling Date | Station Number | Chlorophyll *a* (µg/l) |
|---|---|---|
| 03/12/75 | 1 | 1.2 |
| | 2 | 1.1 |
| | 3 | - |
| 06/26/75 | 1 | 3.3 |
| | 2 | 2.4 |
| | 3 | - |
| 11/11/75 | 1 | 2.6 |
| | 2 | 5.4 |
| | 3 | 5.7 |

C. Limiting Nutrient Study:

A significant change in nutrients occurred in the assay sample from the time of collection to the beginning of the assay, and the results are not considered representative of conditions in the reservoir at the time the sample was taken.

The reservoir data indicate nitrogen limitation at all sampling times; i.e., the mean inorganic nitrogen to orthophosphorus ratios were 10 to 1 in March and 8 to 1 in June and November. However, because of turbidity, primary productivity may be light-limited at times rather than nutrient-limited.

## IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the California National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of March and April when two samples were collected. Sampling was begun in November, 1974, and was completed in November, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the California District Office of the U.S. Geological Survey for the tributary sites nearest the reservoir.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the nutrient loads at station A-2, in $kg/km^2/year$, and multiplying by the ZZ area in $km^2$.

No known wastewater treatment plants impacted Lake Mendocino during the sampling year.

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* See Working Paper No. 175.

A. Waste Source:

1. Known municipal - None

2. Known industrial - None

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

| Source | kg P/ yr | % of total |
|---|---|---|
| a. Tributaries (non-point load) - | | |
| E. Fk. Russian River | 28,240 | 90.1 |
| b. Minor tributaries & immediate drainage (non-point load) - | 2,980 | 9.5 |
| c. Known municipal STP's - None | - | - |
| d. Septic tanks - Unknown | ? | ? |
| e. Known industrial - None | - | - |
| f. Direct precipitation* - | 140 | 0.4 |
| Total | 31,360 | 100.0 |

2. Outputs -

| | |
|---|---|
| Reservoir outlet - E. Fk. Russian R. | 19,285 |

3. Net annual P accumulation - 12,075 kg.

* See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

| Source | kg N/yr | % of total |
|---|---|---|
| a. Tributaries (non-point load) - | | |
| E. Fk. Russian River | 347,915 | 88.5 |
| b. Minor tributaries & immediate drainage (non-point load) - | 36,715 | 9.3 |
| c. Known municipal STP's - None | - | - |
| d. Septic tanks - Unknown | ? | - |
| e. Known industrial - None | - | - |
| f. Direct precipitation* - | 8,550 | 2.2 |
| Total | 393,180 | 100.0 |

2. Outputs -

| | |
|---|---|
| Reservoir outlet - E. Fk. Russian R. | 275,870 |

3. Net annual N accumulation - 117,310 kg.

D. Non-point Nutrient Export by Subdrainage Area:

| Tributary | kg P/km$^2$/yr | kg N/km$^2$/yr |
|---|---|---|
| E. Fk. Russian River | 118 | 1,457 |

E. Nutrient Concentrations in Ungaged Stream:

| Tributary | Mean Total P Conc. (mg/l) | Mean Total N Conc. (mg/l) |
|---|---|---|
| Cold Creek | 0.082 | 0.931 |

* See Working Paper No. 175.

F. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

| | Total Phosphorus | | Total Nitrogen | |
|---|---|---|---|---|
| | Total | Accumulated | Total | Accumulated |
| grams/$m^2$/yr | 3.96 | 1.52 | 49.6 | 14.8 |

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Lake Mendocino:

| | |
|---|---|
| "Dangerous" (eutrophic loading) | 1.22 |
| "Permissible" (oligotrophic loading) | 0.61 |

## V. LITERATURE REVIEWED

Allum, M. O., R. E. Glessner, and J. H. Gakstatter, 1977. An evaluation of the National Eutrophication Survey data. Working Paper No. 900, Corvallis Env. Res. Lab., Corvallis, OR.

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# VI. APPENDICES

## APPENDIX A

## LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

| LAKE CODE | LAKE NAME | MEDIAN TOTAL P | MEDIAN INORG N | 500-MEAN SEC | MEAN CHLORA | 15-MIN DO | MEDIAN DISS ORTHO P |
|---|---|---|---|---|---|---|---|
| 0601 | AMADOR RESERVOIR | 0.040 | 0.390 | 408.667 | 22.383 | 14.600 | 0.020 |
| 0602 | BOCA LAKE | 0.012 | 0.040 | 372.833 | 1.700 | 6.800 | 0.003 |
| 0603 | LAKE BRITTON | 0.067 | 0.115 | 448.500 | 4.811 | 11.200 | 0.047 |
| 0604 | CASITAS RESERVOIR | 0.029 | 0.050 | 400.250 | 3.192 | 14.000 | 0.014 |
| 0605 | CROWLEY LAKE | 0.046 | 0.045 | 374.750 | 5.800 | 12.200 | 0.034 |
| 0606 | DON PEDRO RESERVOIR | 0.013 | 0.060 | 381.733 | 3.564 | 11.400 | 0.004 |
| 0607 | LAKE ELSINORE | 0.469 | 0.120 | 489.214 | 70.572 | 8.000 | 0.092 |
| 0608 | FALLEN LEAF RESERVOIR | 0.007 | 0.040 | 24.357 | 0.786 | 8.800 | 0.005 |
| 0609 | LAKE HENNESSEY | 0.027 | 0.060 | 416.000 | 4.525 | 15.000 | 0.012 |
| 0610 | LAKE HENSHAW | 0.138 | 0.070 | 461.000 | 26.783 | 9.800 | 0.073 |
| 0611 | IRON GATE RESERVOIR | 0.184 | 0.690 | 440.333 | 6.217 | 13.800 | 0.124 |
| 0614 | LOPEZ LAKE | 0.371 | 0.090 | 372.000 | 8.658 | 15.000 | 0.343 |
| 0615 | LAKE MARY | 0.010 | 0.040 | 296.000 | 2.550 | 10.600 | 0.002 |
| 0616 | LAKE MENDOCINO | 0.020 | 0.050 | 436.500 | 3.100 | 9.400 | 0.008 |
| 0617 | NICASIO RESERVOIR | 0.055 | 0.345 | 482.778 | 6.633 | 9.800 | 0.013 |
| 0618 | LOWER OTAY RESERVOIR | 0.058 | 0.180 | 447.250 | 15.933 | 15.000 | 0.013 |
| 0619 | LAKE PILLSBURY | 0.022 | 0.060 | 466.667 | 6.389 | 8.200 | 0.008 |
| 0620 | SANTA MARGARITA LAKE | 0.037 | 0.070 | 400.000 | 9.122 | 14.800 | 0.014 |
| 0621 | SHASTA LAKE | 0.021 | 0.060 | 381.542 | 4.087 | 9.000 | 0.015 |
| 0622 | SHAVER | 0.014 | 0.060 | 346.400 | 1.700 | 7.400 | 0.004 |
| 0623 | SILVER LAKE | 0.012 | 0.055 | 356.000 | 1.800 | 7.000 | 0.003 |
| 0624 | TULLOCK RESERVOIR | 0.025 | 0.060 | 433.000 | 13.878 | 7.400 | 0.009 |
| 0625 | UPPER TWIN LAKES | 0.015 | 0.040 | 300.200 | 3.340 | 7.400 | 0.004 |
| 0626 | LOWER TWIN LAKES | 0.014 | 0.040 | 248.000 | 2.900 | 11.400 | 0.003 |

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

| LAKE CODE | LAKE NAME | MEDIAN TOTAL P | MEDIAN INORG N | 500-MEAN SEC | MEAN CHLORA | 15-MIN DO | MEDIAN DISS ORTHO P | INDEX NO |
|---|---|---|---|---|---|---|---|---|
| 0601 | AMADOR RESERVOIR | 35 ( 8) | 4 ( 1) | 43 ( 10) | 9 ( 2) | 17 ( 4) | 26 ( 6) | 134 |
| 0602 | BOCA LAKE | 89 ( 20) | 98 ( 22) | 70 ( 16) | 91 ( 21) | 100 ( 23) | 91 ( 20) | 539 |
| 0603 | LAKE BRITTON | 17 ( 4) | 22 ( 5) | 17 ( 4) | 48 ( 11) | 43 ( 10) | 17 ( 4) | 164 |
| 0604 | CASITAS RESERVOIR | 43 ( 10) | 74 ( 17) | 48 ( 11) | 70 ( 16) | 22 ( 5) | 37 ( 8) | 294 |
| 0605 | CROWLEY LAKE | 30 ( 7) | 78 ( 18) | 65 ( 15) | 43 ( 10) | 30 ( 7) | 22 ( 5) | 268 |
| 0606 | DON PEDRO RESERVOIR | 83 ( 19) | 54 ( 11) | 57 ( 13) | 61 ( 14) | 37 ( 8) | 78 ( 17) | 370 |
| 0607 | LAKE ELSINORE | 0 ( 0) | 17 ( 4) | 0 ( 0) | 0 ( 0) | 78 ( 18) | 9 ( 2) | 104 |
| 0608 | FALLEN LEAF RESERVOIR | 100 ( 23) | 87 ( 19) | 100 ( 23) | 100 ( 23) | 70 ( 16) | 70 ( 16) | 527 |
| 0609 | LAKE HENNESSEY | 48 ( 11) | 54 ( 11) | 39 ( 9) | 52 ( 12) | 4 ( 0) | 52 ( 12) | 249 |
| 0610 | LAKE HENSHAW | 13 ( 3) | 33 ( 7) | 13 ( 3) | 4 ( 1) | 54 ( 12) | 13 ( 3) | 130 |
| 0611 | IRON GATE RESERVOIR | 9 ( 2) | 0 ( 0) | 26 ( 6) | 39 ( 9) | 26 ( 6) | 4 ( 1) | 104 |
| 0614 | LOPEZ LAKE | 4 ( 1) | 26 ( 6) | 74 ( 17) | 26 ( 6) | 4 ( 0) | 0 ( 0) | 134 |
| 0615 | LAKE MARY | 96 ( 22) | 87 ( 19) | 91 ( 21) | 83 ( 19) | 48 ( 11) | 100 ( 23) | 505 |
| 0616 | LAKE MENDOCINO | 65 ( 15) | 70 ( 16) | 30 ( 7) | 74 ( 17) | 61 ( 14) | 63 ( 14) | 363 |
| 0617 | NICASIO RESERVOIR | 26 ( 6) | 9 ( 2) | 4 ( 1) | 30 ( 7) | 54 ( 12) | 46 ( 10) | 169 |
| 0618 | LOWER OTAY RESERVOIR | 22 ( 5) | 13 ( 3) | 22 ( 5) | 13 ( 3) | 4 ( 0) | 46 ( 10) | 120 |
| 0619 | LAKE PILLSBURY | 57 ( 13) | 41 ( 9) | 9 ( 2) | 35 ( 8) | 74 ( 17) | 63 ( 14) | 279 |
| 0620 | SANTA MARGARITA LAKE | 39 ( 9) | 33 ( 7) | 52 ( 12) | 22 ( 5) | 13 ( 3) | 37 ( 8) | 196 |
| 0621 | SHASTA LAKE | 61 ( 14) | 54 ( 11) | 61 ( 14) | 57 ( 13) | 65 ( 15) | 30 ( 7) | 328 |
| 0622 | SHAVER | 78 ( 18) | 41 ( 9) | 83 ( 19) | 96 ( 22) | 87 ( 19) | 78 ( 17) | 463 |
| 0623 | SILVER LAKE | 89 ( 20) | 65 ( 15) | 78 ( 18) | 87 ( 20) | 96 ( 22) | 91 ( 20) | 506 |
| 0624 | TULLOCK RESERVOIR | 52 ( 12) | 54 ( 11) | 35 ( 8) | 17 ( 4) | 87 ( 19) | 57 ( 13) | 302 |
| 0625 | UPPER TWIN LAKES | 70 ( 16) | 98 ( 22) | 87 ( 20) | 65 ( 15) | 87 ( 19) | 78 ( 17) | 485 |
| 0626 | LOWER TWIN LAKES | 74 ( 17) | 87 ( 19) | 96 ( 22) | 78 ( 18) | 37 ( 8) | 91 ( 20) | 463 |

LAKES RANKED BY INDEX NOS.

| RANK | LAKE CODE | LAKE NAME | INDEX NO |
|---|---|---|---|
| 1 | 0602 | BOCA LAKE | 539 |
| 2 | 0608 | FALLEN LEAF RESERVOIR | 527 |
| 3 | 0623 | SILVER LAKE | 506 |
| 4 | 0615 | LAKE MARY | 505 |
| 5 | 0625 | UPPER TWIN LAKES | 485 |
| 6 | 0626 | LOWER TWIN LAKES | 463 |
| 7 | 0622 | SHAVER | 463 |
| 8 | 0606 | DON PEDRO RESERVOIR | 370 |
| 9 | 0616 | LAKE MENDOCINO | 363 |
| 10 | 0621 | SHASTA LAKE | 328 |
| 11 | 0624 | TULLOCK RESERVOIR | 302 |
| 12 | 0604 | CASITAS RESERVOIR | 294 |
| 13 | 0619 | LAKE PILLSBURY | 279 |
| 14 | 0605 | CROWLEY LAKE | 268 |
| 15 | 0609 | LAKE HENNESSEY | 249 |
| 16 | 0620 | SANTA MARGARITA LAKE | 196 |
| 17 | 0617 | NICASIO RESERVOIR | 169 |
| 18 | 0603 | LAKE BRITTON | 164 |
| 19 | 0614 | LOPEZ LAKE | 134 |
| 20 | 0601 | AMADOR RESERVOIR | 134 |
| 21 | 0610 | LAKE HENSHAW | 130 |
| 22 | 0618 | LOWER OTAY RESERVOIR | 120 |
| 23 | 0607 | LAKE ELSINORE | 104 |
| 24 | 0611 | IRON GATE RESERVOIR | 104 |

# APPENDIX B

## CONVERSION FACTORS

## CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x $8.107 \times 10^{-4}$ = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

# APPENDIX C

## TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR CALIFORNIA 09/24/76

LAKE CODE 0616 LAKE MENDOCINO

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 271.9

| TRIBUTARY | SUB-DRAINAGE AREA(SQ KM) | NORMALIZED FLOWS(CMS) JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | MEAN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0616A1 | 271.9 | 27.18 | 16.59 | 11.24 | 6.85 | 5.66 | 6.54 | 7.65 | 7.93 | 6.97 | 6.88 | 7.53 | 13.93 | 10.40 |
| 0616A2 | 238.8 | 26.70 | 16.82 | 13.85 | 9.91 | 6.63 | 4.59 | 4.81 | 4.53 | 6.80 | 7.79 | 8.64 | 14.95 | 10.48 |
| 0616ZZ | 33.2 | 1.529 | 1.416 | 0.793 | 0.566 | 0.113 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.227 | 1.076 | 0.472 |

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 271.9
SUM OF SUB-DRAINAGE AREAS = 271.9
TOTAL FLOW IN = 131.73
TOTAL FLOW OUT = 124.96

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

| TRIBUTARY | MONTH | YEAR | MEAN FLOW | DAY | FLOW | DAY | FLOW | DAY | FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 0616A1 | 11 | 74 | 6.088 | 16 | 5.663 | | | | |
| | 12 | 74 | 3.738 | 14 | 4.701 | | | | |
| | 1 | 75 | 6.428 | 18 | 3.171 | | | | |
| | 2 | 75 | 33.414 | 1 | 4.899 | 23 | 18.378 | | |
| | 3 | 75 | 30.865 | 8 | 13.535 | 18 | 0.991 | | |
| | 4 | 75 | 7.051 | 5 | 1.019 | 19 | 7.646 | | |
| | 5 | 75 | 9.203 | 3 | 16.905 | | | | |
| | 6 | 75 | 7.702 | 7 | 8.778 | | | | |
| | 7 | 75 | 7.249 | 28 | 7.759 | | | | |
| | 8 | 75 | 8.778 | 30 | 7.872 | | | | |
| | 9 | 75 | 9.288 | 20 | 9.345 | | | | |
| | 10 | 75 | 9.061 | 11 | 9.118 | | | | |
| 0616A2 | 11 | 74 | 9.316 | 16 | 9.345 | | | | |
| | 12 | 74 | 8.778 | 18 | 8.523 | | | | |
| | 1 | 75 | 9.741 | 18 | 9.146 | | | | |
| | 2 | 75 | 27.977 | 1 | 48.139 | | | | |
| | 3 | 75 | 30.299 | 8 | 37.095 | 18 | 71.358 | | |
| | 4 | 75 | 11.100 | 5 | 12.828 | 19 | 10.307 | | |
| | 5 | 75 | 8.637 | 3 | 10.506 | | | | |
| | 6 | 75 | 5.663 | 7 | 7.249 | | | | |
| | 7 | 75 | 3.738 | 28 | 3.653 | | | | |
| | 8 | 75 | 3.710 | 30 | 3.625 | | | | |
| | 9 | 75 | 8.212 | 20 | 8.920 | | | | |
| | 10 | 75 | 8.665 | 11 | 8.948 | | | | |

# APPENDIX D

# PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/09/24

061501
39 11 52.0 123 10 45.0 3
LAKE MENDOCINO
06045 CALIFORNIA
140291

11EPALES 2111202
0094 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/03/12 | 14 | 20 0000 | 10.0 | 10.2 | 10 | 108 | 7.90 | 66 | 0.040 | 0.400 | 0.150 | 0.019 |
| | 14 | 20 0005 | 10.0 | 10.0 | | 108 | 7.80 | 65 | 0.030 | 0.200 | 0.150 | 0.018 |
| | 14 | 20 0015 | 9.5 | 10.2 | | 106 | 7.75 | 64 | 0.030 | 0.400 | 0.160 | 0.019 |
| | 14 | 20 0030 | 8.9 | 10.0 | | 105 | 7.75 | 65 | 0.030 | 0.300 | 0.160 | 0.018 |
| | 14 | 20 0050 | 8.3 | 10.0 | | 103 | 7.55 | 65 | 0.030 | 0.700 | 0.170 | 0.020 |
| | 14 | 20 0070 | 7.8 | 9.6 | | 102 | 7.50 | 66 | 0.030 | 0.300 | 0.180 | 0.020 |
| | 14 | 20 0090 | 7.5 | 9.6 | | 100 | 7.45 | 65 | 0.030 | 0.300 | 0.200 | 0.021 |
| 75/06/26 | 14 | 20 0000 | 20.8 | 8.0 | 96 | 168 | 8.30 | 76 | 0.030 | 0.200 | 0.020K | 0.003 |
| | 14 | 20 0005 | 20.6 | 8.0 | | 165 | 8.30 | 76 | 0.020 | 0.300 | 0.020K | 0.002 |
| | 14 | 20 0020 | 18.5 | 5.6 | | 148 | 7.60 | 76 | 0.030 | 0.200 | 0.020K | 0.008 |
| | 14 | 20 0040 | 11.5 | 7.4 | | 130 | 7.60 | 75 | 0.030 | 0.200 | 0.100 | 0.022 |
| | 14 | 20 0060 | 9.9 | 6.2 | | 122 | 7.50 | 74 | 0.040 | 0.200 | 0.220 | 0.027 |
| | 14 | 20 0091 | 8.9 | 6.2 | | 130 | 7.50 | 75 | 0.050 | 0.300 | 0.230 | 0.025 |
| 75/11/11 | 12 | 45 0000 | 14.3 | 8.6 | | 107 | 8.40 | 83 | 0.020K | 0.200K | 0.020K | 0.005 |
| | 12 | 45 0005 | 14.1 | 8.6 | | 71 | 8.50 | 79 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 12 | 45 0015 | 14.1 | 8.6 | | 83 | 8.70 | 79 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 12 | 45 0035 | 14.0 | 8.6 | | 72 | 8.50 | 78 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 12 | 45 0060 | 13.8 | 8.6 | | 85 | 8.35 | 82 | 0.020K | 0.200K | 0.020K | 0.006 |
| | 12 | 45 0090 | 13.1 | 8.8 | | 84 | 8.00 | 82 | 0.020K | 0.200K | 0.020K | 0.005 |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/03/12 | 14 | 20 0000 | 0.101 | 1.2 | |
| | 14 | 20 0005 | 0.102 | | |
| | 14 | 20 0015 | 0.106 | | |
| | 14 | 20 0030 | 0.105 | | |
| | 14 | 20 0050 | 0.102 | | |
| | 14 | 20 0070 | 0.103 | | |
| | 14 | 20 0090 | 0.107 | | |
| 75/06/26 | 14 | 20 0000 | 0.013 | 3.3 | |
| | 14 | 20 0005 | 0.013 | | |
| | 14 | 20 0020 | 0.023 | | |
| | 14 | 20 0040 | 0.036 | | |
| | 14 | 20 0060 | 0.050 | | |
| | 14 | 20 0091 | 0.330 | | |
| 75/11/11 | 12 | 45 0000 | 0.015 | 2.6 | |
| | 12 | 45 0005 | 0.013 | | |
| | 12 | 45 0015 | 0.013 | | |
| | 12 | 45 0035 | 0.016 | | |
| | 12 | 45 0060 | 0.017 | | |
| | 12 | 45 0090 | 0.015 | | |

STORET RETRIEVAL DATE 76/09/24

061002
39 13 18.0 123 16 15.0 3
LAKE MENDOCINO
06045 CALIFORNIA
140291

11EPALES 2111202
0035 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/03/12 | 15 | 0000 | 10.2 | 10.2 | 10 | 106 | 7.95 | 64 | 0.030 | 0.500 | 0.160 | 0.021 |
| | 15 | 0005 | 9.9 | 10.2 | | 104 | 7.90 | 63 | 0.030 | 0.200 | 0.150 | 0.020 |
| | 15 | 0015 | 9.6 | 10.0 | | 103 | 7.70 | 67 | 0.030 | 0.200K | 0.170 | 0.023 |
| | 15 | 0031 | 8.9 | 9.8 | | 104 | 7.80 | 66 | 0.030 | 0.300 | 0.160 | 0.021 |
| 75/06/26 | 14 | 0000 | 20.5 | 8.0 | 138 | 171 | 8.35 | 78 | 0.020 | 0.300 | 0.030 | 0.004 |
| | 14 | 0005 | 20.4 | 10.0 | | 169 | 8.20 | 78 | 0.030 | 0.400 | 0.020K | 0.004 |
| | 14 | 0020 | 19.1 | 6.0 | | 164 | 7.70 | 75 | 0.030 | 0.300 | 0.060 | 0.018 |
| | 14 | 0037 | 12.4 | 6.2 | | 140 | 7.60 | 76 | 0.030 | 0.300 | 0.050 | 0.022 |
| 75/11/11 | 13 | 0000 | 14.2 | 8.8 | | 67 | 8.50 | 86 | 0.020K | 0.200K | 0.020K | 0.005 |
| | 13 | 0005 | 14.0 | 9.4 | | 76 | 8.20 | 86 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 13 | 0015 | 13.9 | 8.8 | | 87 | 8.00 | 85 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 13 | 0036 | 13.8 | 8.6 | | 88 | 8.00 | 83 | 0.020K | 0.200 | 0.020K | 0.004 |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/03/12 | 15 | 0000 | 0.113 | 1.1 | |
| | 15 | 0005 | 0.118 | | |
| | 15 | 0015 | 0.114 | | |
| | 15 | 0031 | 0.091 | | |
| 75/06/26 | 14 | 0000 | 0.018 | 2.4 | |
| | 14 | 0005 | 0.014 | | |
| | 14 | 0020 | 0.033 | | |
| | 14 | 0037 | 0.028 | | |
| 75/11/11 | 13 | 0000 | 0.014 | 5.4 | |
| | 13 | 0005 | 0.015 | | |
| | 13 | 0015 | 0.016 | | |
| | 13 | 0036 | 0.017 | | |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/09/24

961503
39 14 05.0 123 10 12.0 3
MENDOCINO LAKE
06045 CALIFORNIA

11EPALES 760114 2111202
0033 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/11/11 | 13 30 | 0000 | 13.9 | 10.6 | | 74 | 8.00 | 82 | 0.020K | 0.300 | 0.020K | 0.004 |
| | 13 30 | 0005 | 13.7 | 9.0 | | 79 | 8.00 | 80 | 0.020K | 0.200K | 0.020K | 0.004 |
| | 13 30 | 0015 | 13.3 | 9.0 | | 71 | 8.00 | 64 | 0.020K | 0.200K | 0.020K | 0.006 |
| | 13 30 | 0029 | 11.7 | 9.8 | | 104 | 8.00 | 92 | 0.020K | 0.200K | 0.040 | 0.010 |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/11/11 | 13 30 | 0000 | 0.017 | 5.7 | |
| | 13 30 | 0005 | 0.017 | | |
| | 13 30 | 0015 | 0.020 | | |
| | 13 30 | 0029 | 0.020 | | |

K VALUE KNOWN TO BE
LESS THAN INDICATED

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# APPENDIX E

## TRIBUTARY DATA

STORET RETRIEVAL DATE 75/09/24

061041
39 11 45.0 123 11 30.0 4
E FORK RUSSIAN RIVER
06 7.5 UKIAH
C/MENDOCINO RESERVOIR 140241
ENR 500 FT DWNSTRM FROM COYOTE DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/16 | 11 15 | | 0.016 | 0.600 | 0.025 | 0.010 | 0.030 |
| 74/12/14 | 09 30 | | 0.050 | 0.900 | 0.030 | 0.010 | 0.030 |
| 75/01/18 | 11 00 | | 0.120 | 1.350 | 0.068 | 0.015 | 0.055 |
| 75/02/01 | 11 00 | | 0.088 | 0.900 | 0.024 | 0.020 | 0.070 |
| 75/02/23 | 18 00 | | 0.120 | 0.800 | 0.032 | 0.032 | 0.110 |
| 75/03/08 | 08 30 | | 0.152 | 0.900 | 0.016 | 0.032 | 0.070 |
| 75/03/18 | 08 30 | | 0.204 | 1.700 | 0.040 | 0.031 | 0.070 |
| 75/04/05 | 09 30 | | 0.165 | 1.750 | 0.130 | 0.030 | 0.110 |
| 75/04/19 | 09 30 | | 0.180 | 0.400 | 0.025 | 0.035 | 0.090 |
| 75/05/03 | 08 30 | | 0.150 | 0.850 | 0.025 | 0.035 | 0.095 |
| 75/06/07 | 10 00 | | 0.160 | 1.400 | 0.020 | 0.030 | 0.030 |
| 75/07/28 | 08 30 | | 0.150 | 0.500 | 0.030 | 0.030 | 0.060 |
| 75/08/30 | 10 00 | | 0.020 | 0.600 | 0.025 | 0.020 | 0.040 |
| 75/09/20 | 09 30 | | 0.005 | 0.500 | 0.025 | 0.015 | 0.027 |
| 75/10/11 | 08 10 | | 0.010 | 0.100 | 0.020 | 0.005 | 0.020 |
| 75/11/08 | 09 30 | | 0.030 | 0.500 | 0.010 | 0.010 | 0.020 |

STORET RETRIEVAL DATE 76/09/24

0610A2
39 14 50.0 123 07 15.0 4
E FORK RUSSIAN RIVER
06 7.5 COW MTN
T/MENDOCINO RESERVOIR 140292
SEC RD BRDG 5 MI E OF CALPELLA
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/15 | 12 | 05 | 0.056 | 0.800 | 0.230 | 0.010 | 0.010 |
| 74/12/18 | 10 | 15 | 0.104 | 0.600 | 0.060 | 0.015 | 0.060 |
| 75/01/18 | 11 | 40 | 0.152 | 1.400 | 0.065 | 0.020 | 0.100 |
| 75/02/01 | 11 | 00 | 0.168 | | 0.064 | 0.045 | |
| 75/03/08 | 09 | 15 | 0.096 | 0.800 | 0.016 | 0.032 | 0.160 |
| 75/03/18 | 09 | 15 | 0.105 | 0.650 | 0.015 | 0.040 | 0.290 |
| 75/04/05 | 10 | 00 | 0.160 | 2.200 | 0.050 | 0.030 | 0.050 |
| 75/04/19 | 10 | 15 | 0.145 | 0.750 | 0.015 | 0.010 | 0.020 |
| 75/05/03 | 09 | 15 | 0.060 | 0.850 | 0.025 | 0.015 | 0.110 |
| 75/06/07 | 10 | 20 | 0.095 | 0.100 | 0.025 | 0.030 | 0.040 |
| 75/07/28 | 09 | 15 | 0.085 | 1.350 | 0.030 | 0.020 | 0.110 |
| 75/08/30 | 11 | 30 | 0.045 | 0.350 | 0.015 | 0.015 | 0.030 |
| 75/09/20 | 10 | 00 | 0.035 | 1.000 | 0.020 | 0.010 | 0.030 |
| 75/10/11 | 09 | 15 | 0.075 | 1.300 | 0.020 | 0.020 | 0.060 |
| 75/11/08 | 10 | 30 | 0.230 | 0.200 | 0.010 | 0.010 | 0.030 |

STORET RETRIEVAL DATE 76/04/24

0010001
39 14 48.0 123 07 38.0 4
COLD CREEK
05 7.5 UKIAH
1/MENDOCINO RESERVOIR 140291
HWY 20 BRDG 4.6 MI E OF CALPELLA
1IEPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/16 | 11 50 | | 0.200 | 0.620 | 0.050 | 0.010 | 0.040 |
| 74/12/14 | 10 00 | | 0.288 | 0.300 | 0.015 | 0.015 | 0.015 |
| 75/01/16 | 11 30 | | 0.384 | 1.250 | 0.005 | 0.010 | 0.025 |
| 75/02/01 | 10 20 | | 0.088 | | 0.056 | 0.060 | |
| 75/03/07 | 09 00 | | 0.064 | 0.800 | 0.008 | 0.032 | 0.400 |
| 75/03/18 | 09 00 | | 0.060 | 2.400 | 0.028 | 0.031 | 0.400 |
| 75/04/05 | 09 50 | | 0.175 | 1.850 | 0.025 | 0.015 | 0.020 |
| 75/04/19 | 10 00 | | 0.070 | 0.650 | 0.015 | 0.020 | 0.040 |
| 75/05/03 | 09 00 | | 0.145 | 0.350 | 0.020 | 0.010 | 0.040 |
| 75/06/07 | 10 30 | | 0.180 | 0.350 | 0.015 | 0.005 | 0.010K |
| 75/07/29 | 09 00 | | 0.180 | 0.050 | 0.010 | 0.010 | 0.020 |
| 75/08/30 | 10 40 | | 0.195 | 0.550 | 0.015 | 0.020 | 0.060 |
| 75/09/20 | 10 15 | | 0.220 | 0.100K | 0.005 | 0.015 | 0.015 |
| 93 75/10/11 | 09 00 | | 0.280 | 0.100K | 0.005 | 0.015 | 0.030 |
| 80 75/11/08 | 10 00 | | 0.030 | 1.200 | 0.022 | 0.010 | 0.030 |

K VALUE KNOWN TO BE
LESS THAN INDICATED